

Implementation Toolbox

Example Alternatives and Options

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Diagrams borrowed from WBRC BMP Retrofit
Final Report

Implementation Toolbox

BEST MANAGEMENT PRACTICES

1. Housekeeping Practices – Non-structural aimed @ prevention - lowest cost, difficult to implement
2. Structural Retrofits – Engineered or designed physical systems aimed @ removal - highest cost, easy to implement
3. Channel/Riparian modifications
4. Ordinances / Regulations – Create incentives

Implementation Toolbox

Housekeeping Practices



Sweeping of parking lots & streets

Implementation Toolbox Housekeeping Practices



Dumpster Area Neatness

Implementation Toolbox

Housekeeping Practices



Proper Waste Disposal

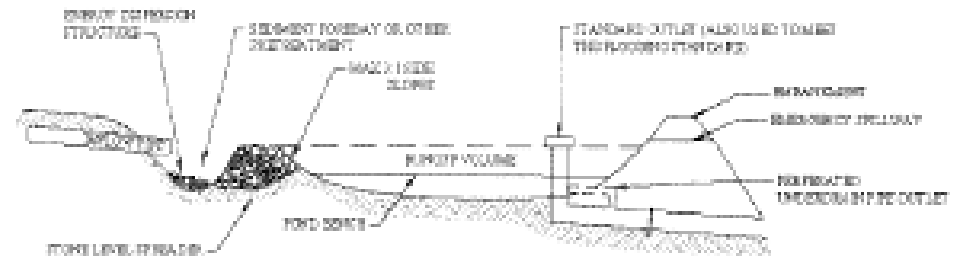
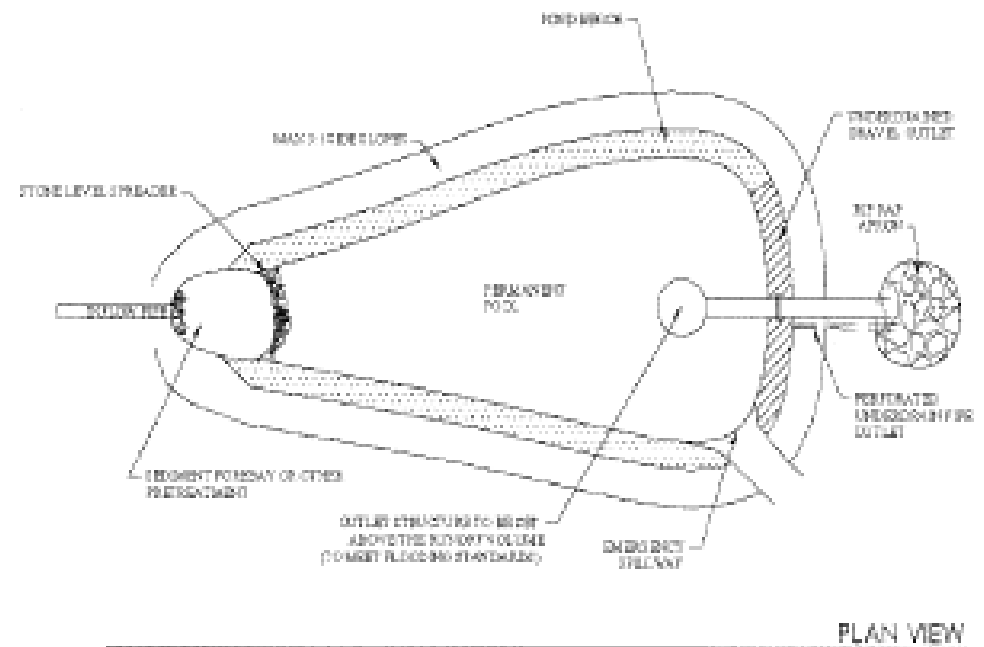
Implementation Toolbox

Structural Retrofits



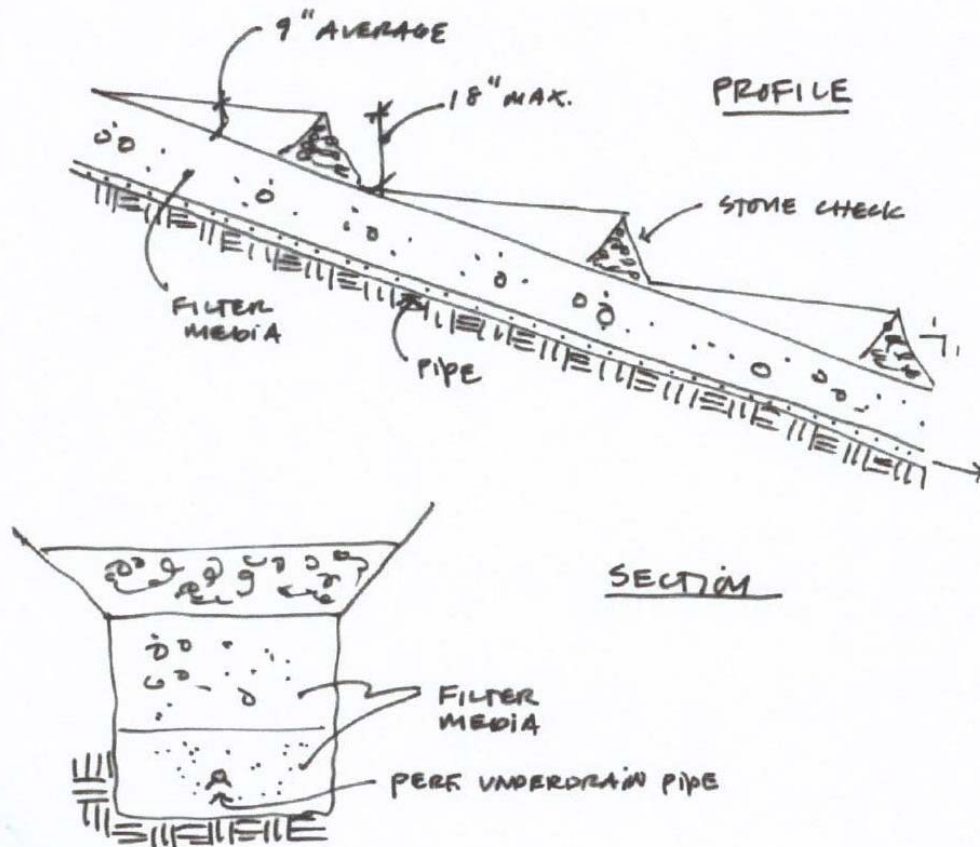
Typical Retention Pond

Typical Wet pond with under drain outlet



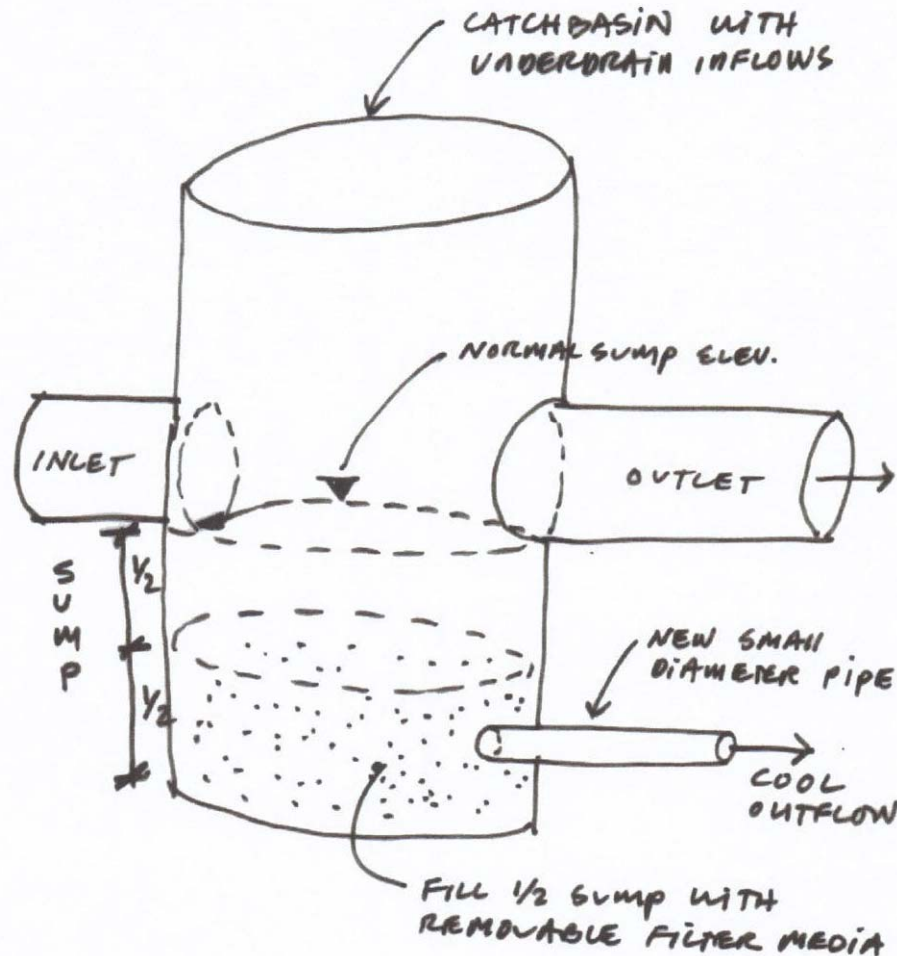
Stone-check underdrained swale

FIGURE 4.1 – STONE-CHECK UNDERDRAINED SWALE



Filtered Catch Basin w/ underdrain outlet

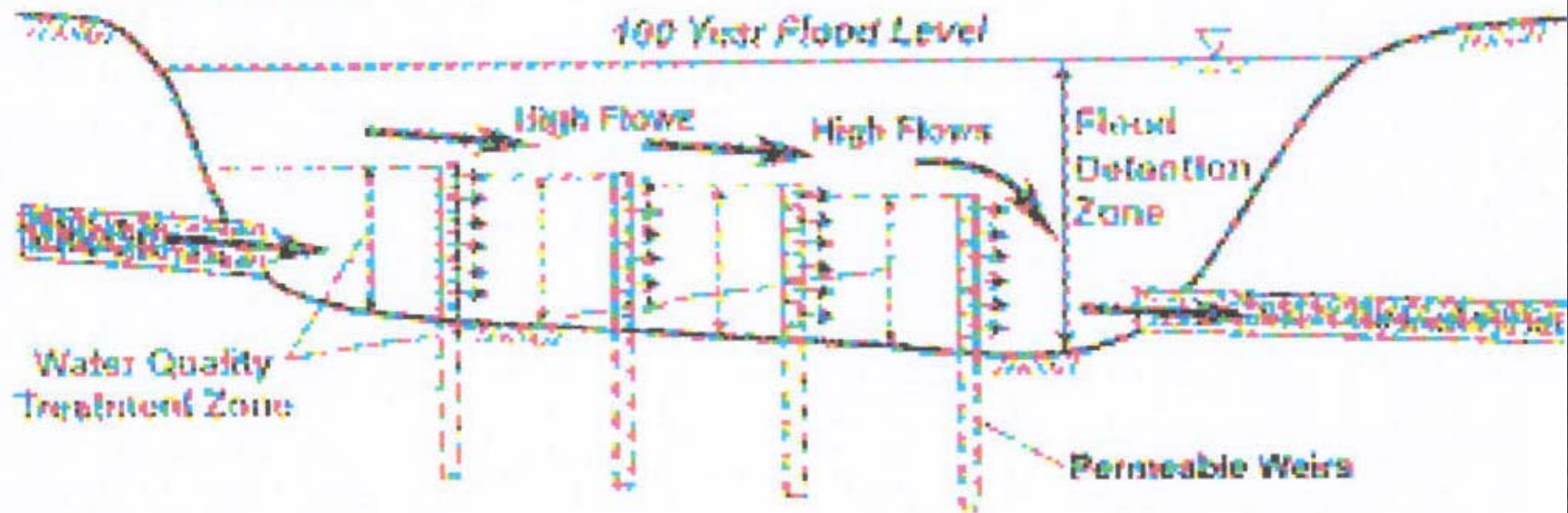
FIGURE 4.2 – STONE-FILTERED CATCH BASIN WITH UNDERDRAIN OUTLET



Dry pond retrofit with permeable weirs

FIGURE 4.3 – DRY POND RETROFIT WITH PERMEABLE WEIRS

Weir Controlled



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Structural Retrofits

Typical parking lot landscape....

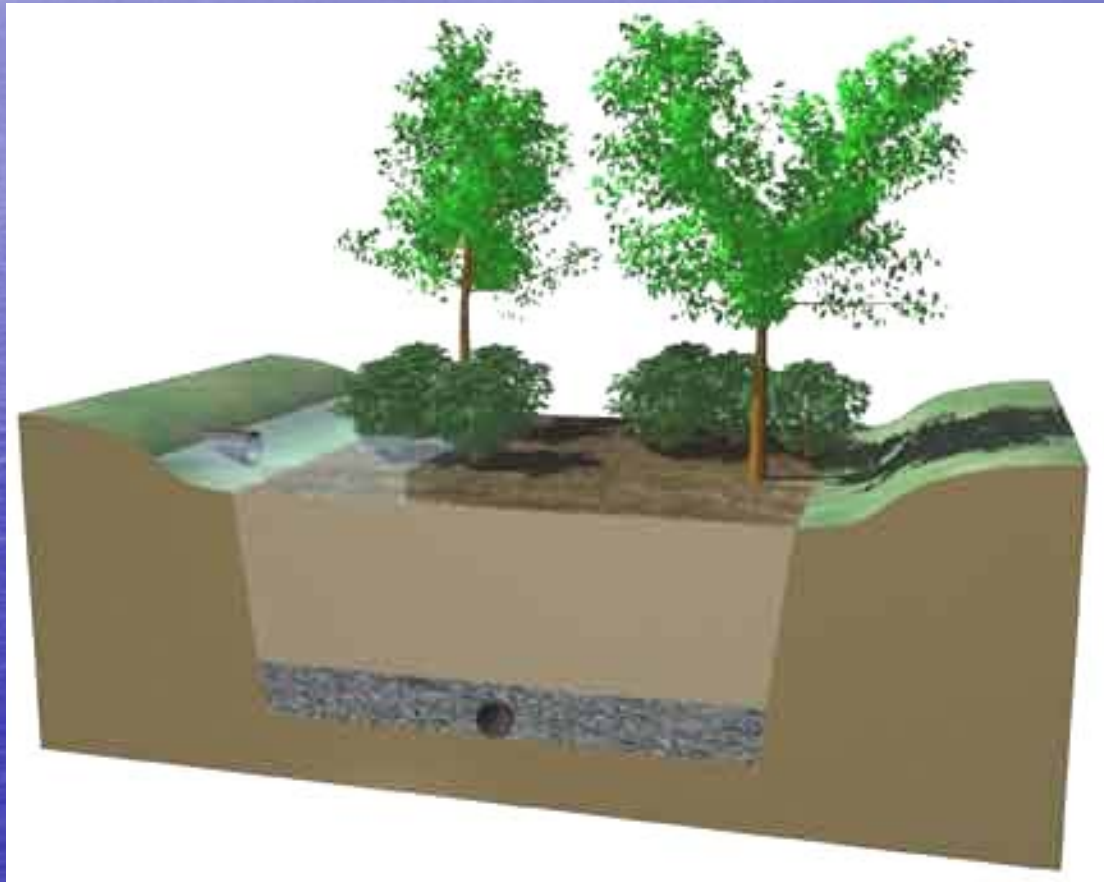


Typical parking lots are designed to remove water from site as fast as possible, with raised landscaped areas which prevent infiltration.

New & improved parking lot =
Bio-retention cells



Bio-retention cell



Implementation Toolbox

Channel & Riparian Tools

Typical stream channel with no canopy cover



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Channel & Riparian Tools

Opportunity to enhance wildlife habitat and recreation potential?



Implementation Toolbox

Channel & Riparian Tools

Channel modifications

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Add or remove curves and

Add or remove depth to improve flow capacity and

Reduce erosion



Implementation Toolbox Ordinances/Regulations

Opportunity to preserve/create/enhance riparian areas



Implementation Toolbox Ordinances/Regulations

Zoning for Stream Protection (Center for Watershed Protection)

**TABLE 2: STRATEGIES TO MINIMIZE IMPERVIOUS AREA AT THE SITE LEVEL
(ADAPTED FROM WELLS 1994, SCHUELER 1994, PZC, INC. 1992)**

1. Reduce residential road widths	13. Vertical parking structures
2. Shorter road lengths	14. Require open space/green space
3. Cul-de-sac donuts	15. Require buffers
4. Disconnect roof leaders	16. Swales rather than curb/gutters
5. Cluster development	17. Encourage runoff to pervious surfaces
6. Angled parking	18. Commercial open space landscaping
7. Smaller parking stalls	19. Sidewalks on one side of street
8. Reduced parking ratios for some land uses	20. Reduce setbacks and frontage
9. Shared parking and driveways	21. Flexible minimum lot sizes
10. Shorter residential driveways	22. "Hourglass" streets
11. Reduced cul-de-sac radii	23. T or V shaped turnarounds
12. Taller buildings (with higher FAR ratios)	24. Permeable spillover parking areas

Implementation Toolbox

Using the right tools, we can go from this.....



Implementation Toolbox

To this...

